GOLETA SANITARY DISTRICT

NPDES MONITORING PROGRAM

2018 ANNUAL REPORT

Submitted: January 28, 2019

CHAPTER 1

INTRODUCTION

The Goleta Sanitary District (GSD) treatment plant operated under WDR Order No. R3-2017-0021 and NPDES Permit No. CA0048160 which became effective November 10, 2017. January through December 2018 the plant was operating utilizing the full secondary process.

The Goleta wastewater treatment plant (WWTP) is located in an unincorporated coastal area of Santa Barbara County, California. Treated wastewater is discharged to the Pacific Ocean approximately one mile offshore of Goleta Beach County Park via a south-trending ocean outfall. The outfall lies within and extends outside of a small embayment formed by Goleta Point directly to the west.

The Goleta WWTP treats wastewater from the service areas of the Goleta Sanitary District (GSD), the Goleta West Sanitary District, the University of California at Santa Barbara, the Santa Barbara Municipal Airport, and certain Santa Barbara County facilities. Existing agreements among the agencies establish GSD as the owner of the joint wastewater treatment facilities and assign the responsibility of operation and maintenance of the facilities to GSD. However, each agency "owns" an "indeterminate, perpetual and exclusive capacity right" in the facilities and an "easement right of flow through" the facilities.

WASTEWATER TREATMENT PROCESS

The following discussion focuses on the principal features of GSD's full secondary process of wastewater and sludge treatment. The performance capacities and characteristics of the treatment plant are detailed in Chapter 2.

Treatment Plant Facilities

The Goleta Sanitary District Wastewater Treatment Plant is located at One William Moffett Place, in an unincorporated area of Santa Barbara County, CA. The plant site is approximately 10 miles west of the City of Santa Barbara, near the Pacific Coast. A regional view of the study area is shown in Figure 1-1.

On average, over the past 10 years, 2009 to 2018, the plant has discharged about 3.65 million gallons per day (MGD) of treated effluent to the open coastal waters of the Santa Barbara Channel via an ocean outfall. The treatment plant is currently discharging municipal wastewater in accordance with NPDES permit CA 0048160. The treatment plant's discharge meets the state water quality standards as set forth in the Water Quality Control Plan for Ocean Waters of California (California Ocean plan) and the federal Clean Water Act.

Facilities Description

The Goleta wastewater treatment plant underwent it's first substantial upgrade completed in June 1988. The upgraded plant was designed to assure compliance with monthly 30-day average discharge limitations of 63 mg/L for suspended solids and 98 mg/L for BOD under an average dry weather flow 9.0 MGD. The facility utilized a split-stream process of physical and biological treatment until December of 2013. The current biological treatment is provided by two trickling filters and an aeration basin to achieve full secondary treatment. The following sections describe the treatment process.

Collection System

Over 190 miles of pipelines collect wastewater that flows almost entirely by gravity to pump stations located in each agency's service area. These stations pump the flow to the treatment facility.

Pump Station and Headworks

Influent from the collection system of each agency is pumped to the treatment plant headworks where raw wastewater flows through two bar screens with ¼ inch screen spacing, which removes large debris. Influent is then routed to aerated grit tanks where sand and grit are allowed to settle out and pumped to screening washer/compactor units. This debris and grit is then transported via truck to a local landfill. Air collected from the influent pump stations and headworks is scrubbed in a biological odor reduction tower.

Primary Sedimentation

Wastewater then flows into one of three circular primary sedimentation basins (primary clarifiers) where solids settling to the bottom and floatable materials rising to the surface are mechanically collected and pumped to digesters.

Secondary Treatment

Secondary treatment involves three treatment elements: the biofilters, an aeration basin, and secondary sedimentation tanks. In the biofilter, primary effluent trickles over plastic media where bacteria feed on organic wastes, thus removing these wastes from the water. Effluent from the trickling filter flows to an aeration basin where air is injected and the effluent is mixed with recirculated sludge from the secondary sedimentation basins. The resulting biological action coagulates these fine particles and the organic solids settle out as sludge in two secondary sedimentation tanks. The waste activated sludge (WAS) is pumped to two mechanical thickeners and then is pumped to the three anaerobic digesters. A portion of the secondary process flow can be diverted to the reclamation facilities for tertiary treatment with gravity filters.

Chlorine Contact Channel

The secondary effluent flows to the head of the chlorine contact channel where sodium hypochlorite is injected to kill bacteria in the effluent. Prior to discharge into the ocean, sodium bisulfite is added for dechlorination, thus completing the disinfection process.

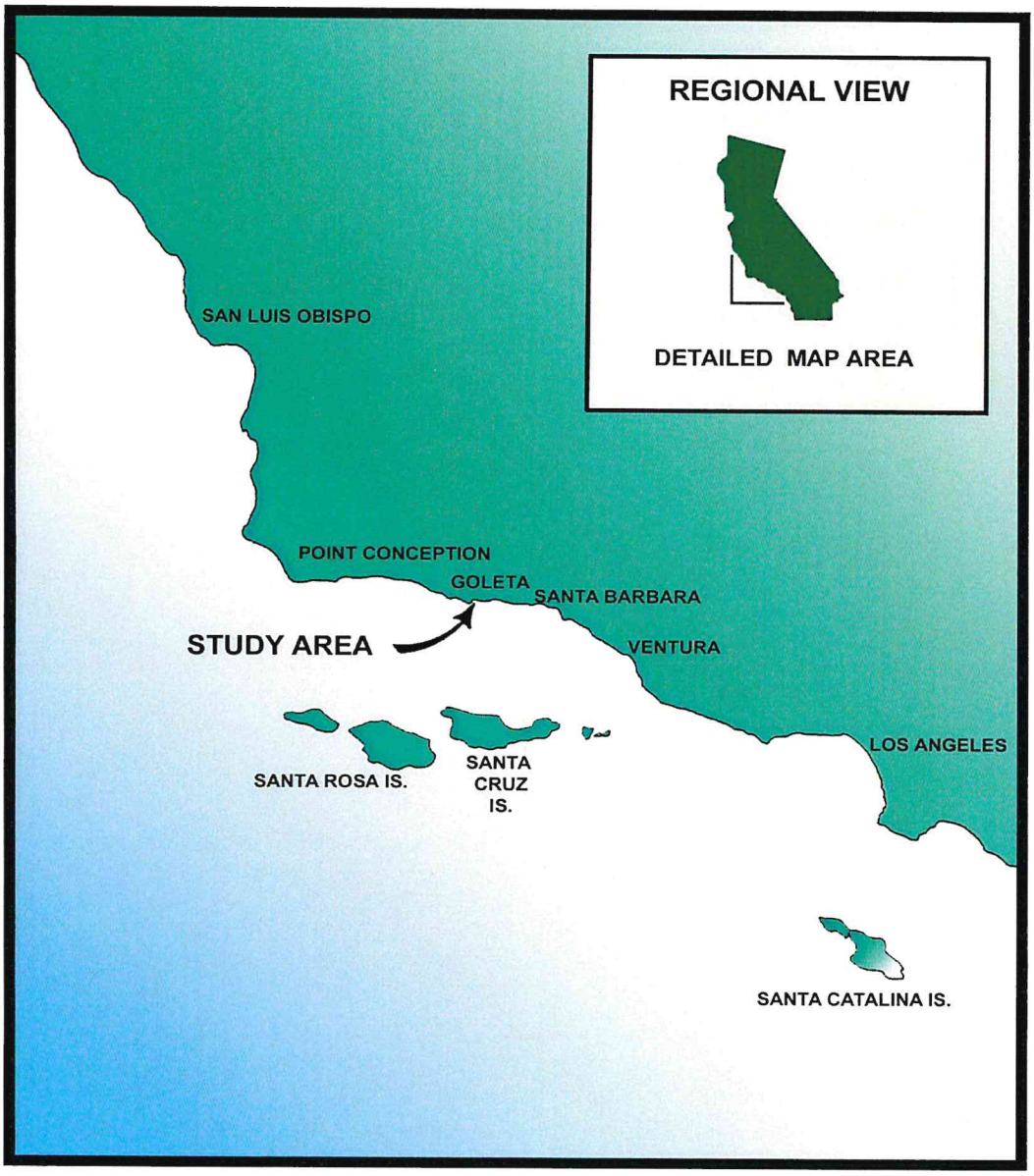
Sludge Treatment and Biosolids Disposal

Settleable solids and floatable materials from the primary clarifiers are treated in three heated anaerobic sludge digesters for at least 15 days. Anaerobic digestion decomposes organic material and produces digester gas composed primarily of methane. This digester gas fuels boilers used to heat sludge in the digesters. Sludge from the digesters then flows to one of two stabilization basins where it settles and bacteria can continue the organic decomposition. Stabilized sludge is dredged from the bottom of these basins and is dewatered by two screw presses. The digested supernatant from the three anaerobic digesters can also be diverted from the stabilization basins directly to the two screw presses for dewatering.

A small portion of the sludge is air dried in the sludge drying beds and converted into Class A biosolids, for use by the local community. The screw pressed biosolids, identified as Class B, were transported by Western Express Inc. to Liberty Composting Inc. located at 12421 Holloway Road, Lost Hills, CA 93249. The administrative office for Western Express Inc., is located at 1533 E. Shields Ave., Suite F, Fresno, CA 93607. Copies of the agreement with Liberty Composting and the agreement with Western Express are available upon request.

A complete biosolids report describing the treatment and disposal process is prepared each year and submitted to the EPA. The deadline for submittal of this report is Februay 19th of each year.

Figure 1-1. Regional View of the Goleta Valley



Reclamation Facilities

On September 13, 1991, the California Regional Water Quality Control Board, Central Coast Region approved Order No. 91-03 that permits the Goleta Sanitary District to produce up to 3.0 MGD of reclaimed water. The reclaimed water produced at the Goleta Sanitary District is distributed by the Goleta Water District for use within their service area. Reclaimed water is used for landscape irrigation and for incidental uses including construction dust control and compaction, and to flush toilets within several buildings located in Goleta. The Goleta Water District is regulated by separate water reclamation requirements.

Secondary effluent enters the reclamation facilities where a flash mixer disperses aluminum sulfate (alum) and polymer into the water. The flocculated suspension is then filtered through a bed of anthracite coal where the floc is removed. The filtered water then flows to a chlorine contact tank where sodium hypochlorite is added for disinfection. The highly chlorinated treated water then flows to a 3 million-gallon underground storage tank where it is stored until needed. Reclaimed water is distributed throughout the Goleta Valley by a distribution system operated and maintained by the Goleta Water District.

An annual report describing the reclamation treatment process, operational parameters, water quality, and production rates is prepared and sumbitted to the RWQCB by January 31st.

Ocean Outfall

The treated secondary effluent is discharged to the ocean through an outfall pipe that extends 5800 feet offshore and terminates at a depth of approximately 92 feet below Mean Lower Low Water (MLLW) level. At the pipe terminus, a multi-port diffuser with 36, four inch diameter ports mixes one part of effluent with approximately 122 parts of seawater (Tetra Tech, Inc. 1993) to achieve a high initial wastewater dilution.

Staff

Mr. Steve Wagner, P.E., currently serves as GSD's General Manager and District Engineer. The General Manager is responsible for overall operation and performance of the treatment plant.

Eleven state certified treatment plant operators operated the wastewater treatment plant under the direction of Mr. Robert Hidalgo, the District Operations Manager, until July. Mr. John Crisman became the Plant Operations Manager in July 2018 and continues to direct the operation of the wastewater treatment facility. The Plant Operations Manager also supervises the treatment plant's industrial waste staff. Mr. Chuck Smolnikar, supervises the maintenance staff and the laboratory is under the direction of Ms. Lena Cox, the Laboratory and Technical Services Manager. The grade and certification number of operations, maintenance, industrial waste control, and laboratory personnel employed during the 2018 operational year are shown in Table 1-1.

Table 1-1. Goleta Sanitary District Operation Staff, 2018

Staff	Grade	California Certification No.
Operators		
Robert Hidalgo	V	6905
Todd Frederick	V	27633
John Crisman	V	28857
Stephen Conklin	III	7065
Ricardo Lopez	III	10756
Francisco M. Lemus	III	10893
Pete Regis	III	28277
Morgan Lea	III	28400
Jes Hulbert	I	28266
River Ferrara	I	28488
Justin Graves	I	43450
Lab Analysts		
Lena Cox	IV	90334003
Jacob Broad	II	1308213493
Robert Hidalgo	I	741
Teresa Kistner	I	99076111
Todd Frederick	I	60731013
River Ferrara	I	1308214257
John Crisman	I	1308214787
Maintenance Technologist		
Carl Easter	III	1308213756
Alejandro Bautista	I	1308213795
Torrey Jones	I	1308217681
Robert Hidalgo	I	1087
Electrical / Instrumentation		
Charles Smolnikar	II	60172004
Dept. of Industrial Relations – Electrician		
Charles Smolnikar	NA	107709
Mike Sullivan	NA	139336
Ramon Garza	NA	160174
Environmental Compliance		
Teresa Kistner	II	3014202
Biosolids Land Application Management		
Lena Cox	I	70711001

Monitoring and Reporting Program

The Goleta Sanitary District's monitoring and reporting program was conducted in accordance with the requirements of the NPDES permit CA0048160. The objectives of the monitoring program and this report are to:

- Determine compliance with NPDES permit terms and conditions.
- Document training and certification of wastewater treatment facility operators.
- Assess treatment plant performance and the effectiveness of industrial pretreatment and toxics control programs.
- Evaluate the monitoring and reporting program and make recommendations for improving the program.

The self-monitoring and reporting program consists of assessing water quality and compliance with effluent limits. Table 1-2 summarizes the sampling schedule for various elements of the monitoring and reporting program conducted during 2018.

Table 1-2. Schedule for NPDES Monitoring, Goleta Sanitary District, 2018

Monitoring Program Component	Frequency	Schedule
Standard Wastewater Parameters	Daily - Weekly	As Specified
Chronic Toxicity	Quarterly	Jan, April, July, and Oct
Influent and Effluent Metals	Annually	October
Influent and Effluent Priority Pollutants	Annually	October
Outfall Inspection	Annually	October

Influent, and effluent water monitoring is conducted in accordance with U.S. Environmental Protection Agency approved test procedures as stipulated under Title 40 of the Code of Federal Regulations, Section 136 (40 CFR 136): *Guidelines establishing test procedures for the analysis of pollutants*. Water quality analyses for compliance monitoring are performed by analytical laboratories certified by the California Environmental Laboratory Accrediation Program. Bioassay testing is conducted in accordance with guidelines approved by the State Water Resources Control Board and the EPA.

In order to comply with a request from the Central Coast RWQCB in a letter dated June 27, 2008 the District is no longer submitting hard copies of NPDES reports to the RWQCB. All documents are converted into a searchable PDF format and are submitted electronically.

REPORT ORGANIZATION

This report summarizes data collected during the 2018 monitoring and reporting program, and analyzes this data to determine compliance with the discharge permit terms and conditions.

Chapter presentation is as follows:

Chapter 1	Introduction
Chapter 2	Treatment Plant Performance
Chapter 3	Outfall Dive Survey
Chapter 4	Collection System Summary

CHAPTER 2

TREATMENT PLANT PERFORMANCE

The performance of a wastewater treatment plant is measured by its ability to reduce influent contaminants to levels acceptable for discharge to the environment. Federal and state authorities mandate these levels of treatment in order to protect the marine environment. Proper operation of the Goleta Sanitary District's wastewater treatment plant is assured through the monitoring of several effluent parameters such as flow, total suspended solids, biochemical oxygen demand, residual chlorine, hydrogen-ion concentration (pH), turbidity, settleable solids, oil and grease, and toxicity concentration. Metals, pesticides, and other priority pollutants are also analyzed to aid in determining the impact the wastewater discharge has on receiving waters, evaluating compliance with discharge permit limitations, and monitoring the effectiveness of the industrial pretreatment and toxic control program.

WASTEWATER CHARACTERIZATION

Goleta Sanitary District's NPDES monitoring program requires measurement of many parameters at frequencies ranging from continuous to once per year. During 2018, influent, effluent, and biosolids (sludge) samples were collected by treatment plant personnel, and analyzed by the Goleta Sanitary District wastewater treatment plant laboratory and various contract laboratories such as: Aquatic Testing Laboratories (ATL) for acute and chronic toxicity, FGL Environmental Laboratories, Pat-Chem Laboratories, OEC Laboratory, Test America Laboratory and Ceres Analytical Laboratory. Treatment plant personnel monitored and analyzed wastewater for performance-evaluating parameters including wastewater flow, suspended solids, biochemical oxygen demand (BOD), pH, turbidity, settleable solids, ammonia, oil and grease, temperature, residual chlorine, coliform and enterococcus bacteria. The previously mentioned environmental laboratories performed annual analysis of priority pollutants, metals and other parameters in influent, effluent, and biosolids samples. Influent and effluent samples were also analyzed for radioactivity.

Analytical methodologies used by Goleta Sanitary District Laboratory and other contract laboratories used by GSD are based on approved U.S. Environmental Protection Agency (EPA) methods (EPA 1983; Federal Register 1984) and other methods in *Standard Methods for the Examination of Water and Wastewater, 22nd ed.* All methodologies employed during 2018 were approved for NPDES monitoring programs. Quality assurance and quality control procedures followed those presented in *Standard Methods for the Examination of Water and Wastewater, 22nd edition.*

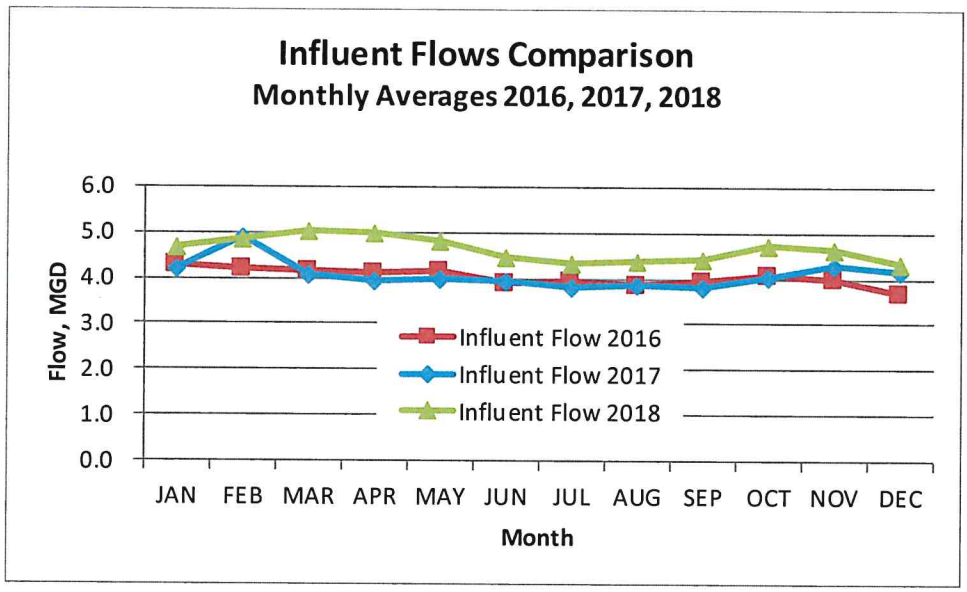
Results of the wastewater chemical analyses used to monitor proper operation of the treatment plant during 2018, and the respective discharge permit limitations, are presented in Tables 2-1 and Table 2-2. All monthly averaged data presented in these tables are calculated from daily values at the treatment plant, with the exception of removal efficiencies, which are calculated from the monthly averages of the respective influent and effluent parameters.

Influent Flow

The daily influent flow into the treatment plant was monitored continuously throughout 2018. Influent flow without the internal plant recirculated flow, averaged 4.6 million gallons per day (MGD) which is a 11% increase compared to the average of 4.1 MGD that was treated in 2017.

Overall, the average monthly influent flows for 2018 varied throughout the year, fluctuating from a low of 4.3 MGD in December to a high of 5.0 MGD in March. The decrease in average influent flow observed at the plant is likely due to water conservation implemented by residents in response to the drought conditions. See Figure 2-1 for a visual flow comparison.

Figure 2-1. Influent Flows Monthly Average Comparison for 2016, 2017 and 2018



The highest flows into the plant during 2018 occurred during the beginning of the year, and may be associated with heavy rains that occurred in March.

Since 2001 the Goleta West Sanitary District and Goleta Sanitary District have maintained an aggressive collection system rehabilitation program. Numerous sections of the collection system in both Districts have been relined or replaced to correct structural deficiencies while significantly reducing the inflow and infiltration (I&I) problems. However, even with the reduction of I&I the amount of rainfall during the year can affect the total amount of influent flow measured. The District's storm water pollution prevention plan requires all storm water collected from process areas to be treated before disposal. After several dry years the low ground water table and dry creeks can reduce the potential for ground water intrusion into the collection systems.

Effluent Flow

The effluent flow from the treatment plant was monitored continuously during 2018 and averaged 3.7 MGD for the year. The difference between the influent and effluent flow is due to the production of reclaimed water, which is not discharged into the ocean but is distributed throughout the community for landscape irrigation and other uses.

Figure 2-2. Influent and Effluent Flows 2018 Monthly Averages

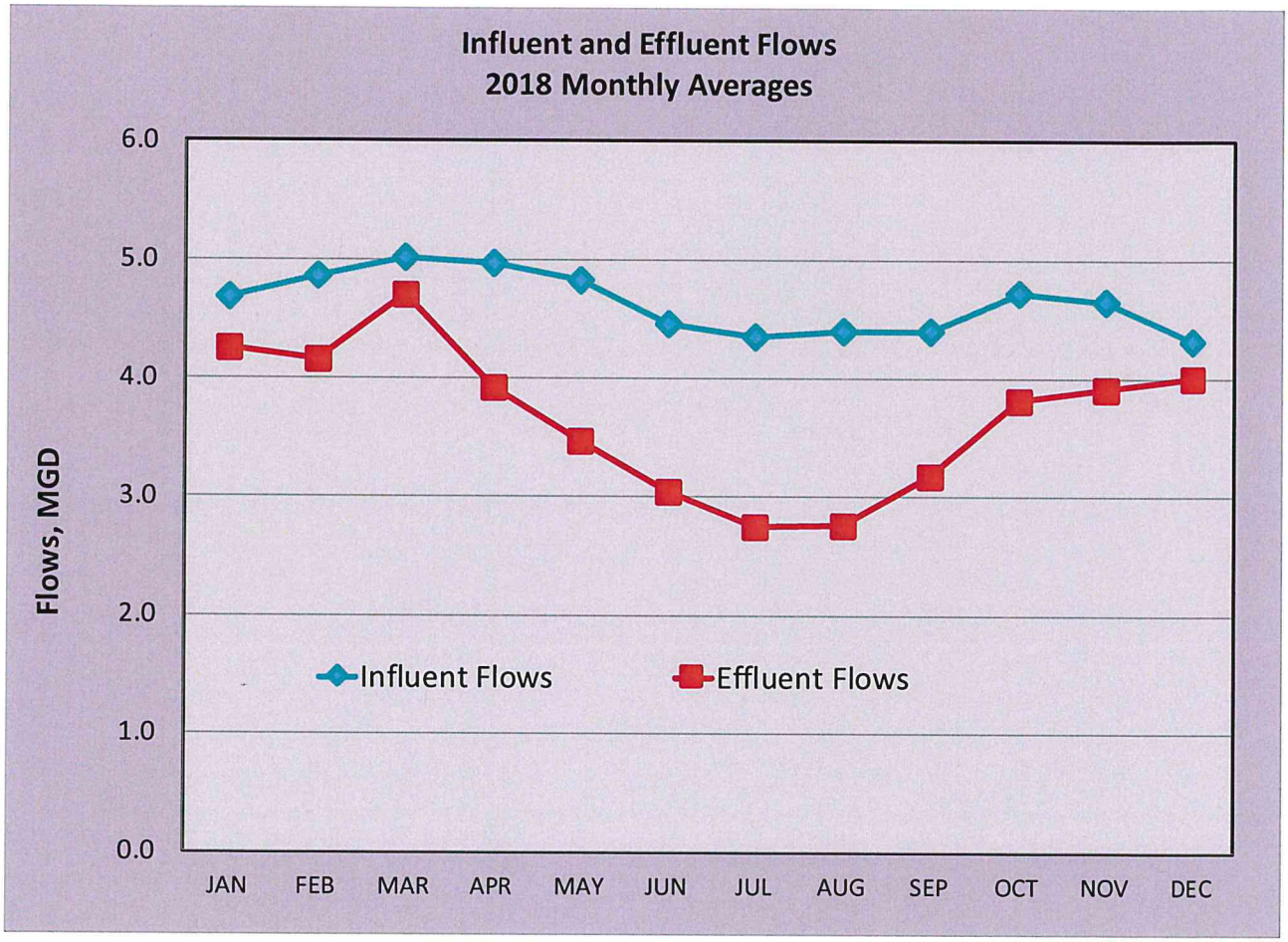


Figure 2-2 shows the monthly average influent and effluent flows for 2018. Higher wastewater effluent flow generally occurs during the winter months when influent flow is also the highest and recycling is minimal. The most important factor contributing to fluctuations in the effluent flow is the amount of wastewater that is processed into reclaimed water and used for irrigation. The lowest effluent flow occurred during July and August when the amount of flow discharged to the Pacific Ocean dropped to 2.8 MGD as depicted in Figure 2-2. The temporal variations in the monthly average effluent flow seen in 2018 fluctuated from a low of 2.75 MGD in July, when the daily production of reclaimed water was one of the highest production months of the year and averaged 1.6 MGD for the month to a high of 4.7 MGD during March when the reclaimed facility was on line for seven days out of the month and a total of 10.6 million gallons were filtered. There was also

significant rainfall during March with approximately 5.39 inches of rain. Figure 2-2 is a time history of the influent and effluent flows and Table 2-1 shows the actual monthly flow average values.

Table 2-1. Monthly Averages Flow, Suspended Solids and BOD, Goleta Sanitary District, 2018.

	Flow		Total Suspended Solids				Biochemical Oxygen Demand			
Month	Influent MGD	Effluent MGD	Influent mg/L	Effluent mg/L	Removal (%)	Mass Emission (lbs/day)	Influent mg/L	Effluent mg/L	Removal (%)	Mass Emission (lbs/day)
Jan	4.68	4.26	380	4.6	98.8	172	372	4.7	98.7	170
Feb	4.86	4.16	395	5.2	98.7	182	358	7.0	98.0	244
Mar	5.02	4.71	399	4.7	98.8	181	406	5.2	98.7	203
Apr	4.97	3.93	434	5.7	98.7	184	414	7.1	98.3	232
May	4.83	3.47	407	7.1	98.3	212	370	7.9	97.8	224
Jun	4.46	3.05	398	6.8	98.3	171	391	6.8	98.2	169
Jul	4.35	2.75	420	8.1	98.1	185	409	8.4	97.9	193
Aug	4.39	2.76	425	7.4	98.3	173	394	7.5	98.1	176
Sep	4.40	3.18	434	5.3	98.6	143	407	7.4	98.1	183
Oct	4.71	3.81	534	6.7	98.7	216	479	7.3	98.6	232
Nov	4.65	3.92	632	5.1	99.1	170	513	6.1	98.7	201
Dec	4.32	4.01	654	6.7	98.8	222	560	6.7	98.7	226
Average	4.64	3.67	459	6.1	98.6	184	423	6.8	98.3	204
Limit	NL	7.64	NL	30	85	1912	NL	30	85	1912

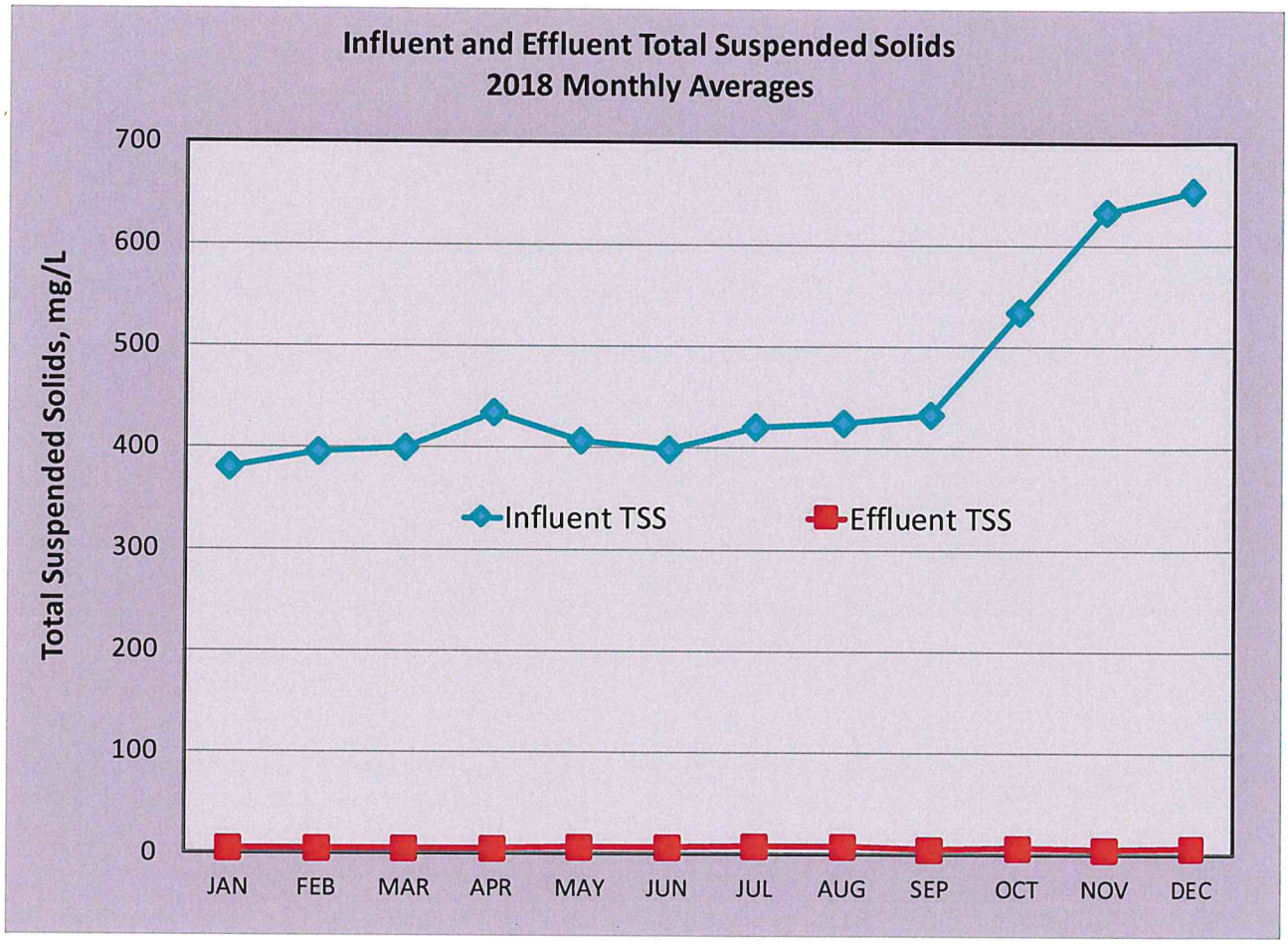
NL = No Limit

Suspended Solids

Influent and effluent suspended solids were measured five days per week on 24-hour composite samples. The effectiveness of the treatment plant in removing suspended solids is demonstrated by the variation of influent solids versus the low-level and consistent output of effluent solids (see Figure 2-3). Influent suspended solids concentrations averaged 459 mg/L for the year an increase of about 22% from the 2017 annual average of 356 mg/L. Figure 2-3 shows a spike in concentration of suspended solids that occurred during October which continued to increase throughout the remainder of the year. The treatment process reduced the concentration of total suspended solids in the effluent to an annual average of 6.1 mg/L an 8% annual decrease of the 6.6 mg/L average of 2017.

All effluent 30-day monthly averages were well below the 30-mg/L monthly average limitation. Overall removal efficiency for the year was an average of 98.6 percent, see Table 2-1.

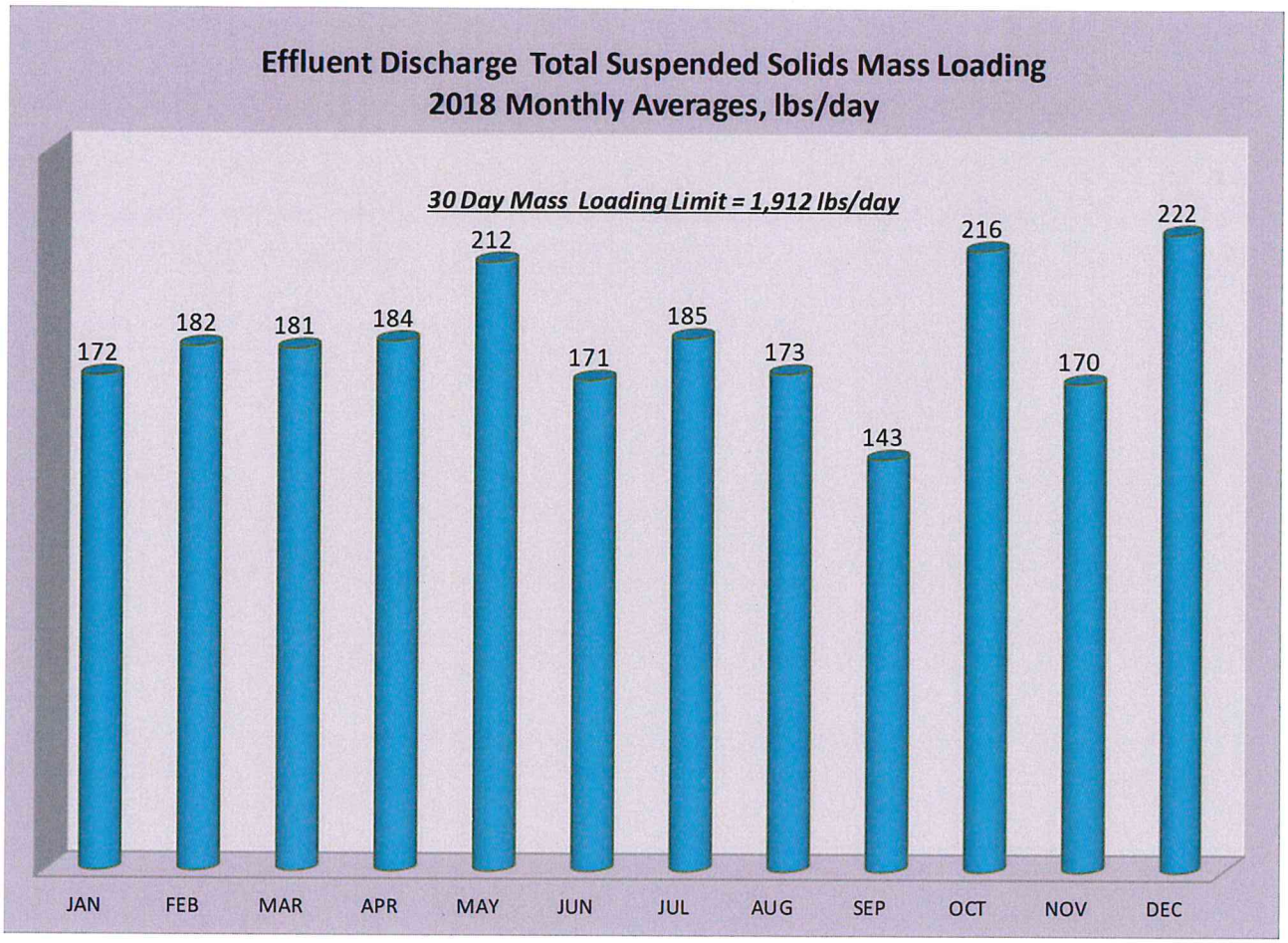
Figure 2-3. Influent and Effluent Total Suspended Solids 2018 Monthly Averages



Average monthly suspended solids mass loading rates for 2018 are represented graphically in Figure 2-4. The mass emission limit is based on average dry weather flow (ADWF) and is a limit applied to dry weather flows (DWF). There is no limit for mass emissions on wet weather flows.

The maximum average monthly mass emission loading for 2018 occurred in December at a high of 222 lbs/day, which is approximately 12 percent of the permitted monthly 30-day average limit of 1,912 lbs/day. Loading rates were well below the discharge limits throughout the year.

Figure 2-4. Effluent Discharge Total Suspended Solids Mass Loading, 2018 Monthly Averages, lbs/day



Biochemical Oxygen Demand

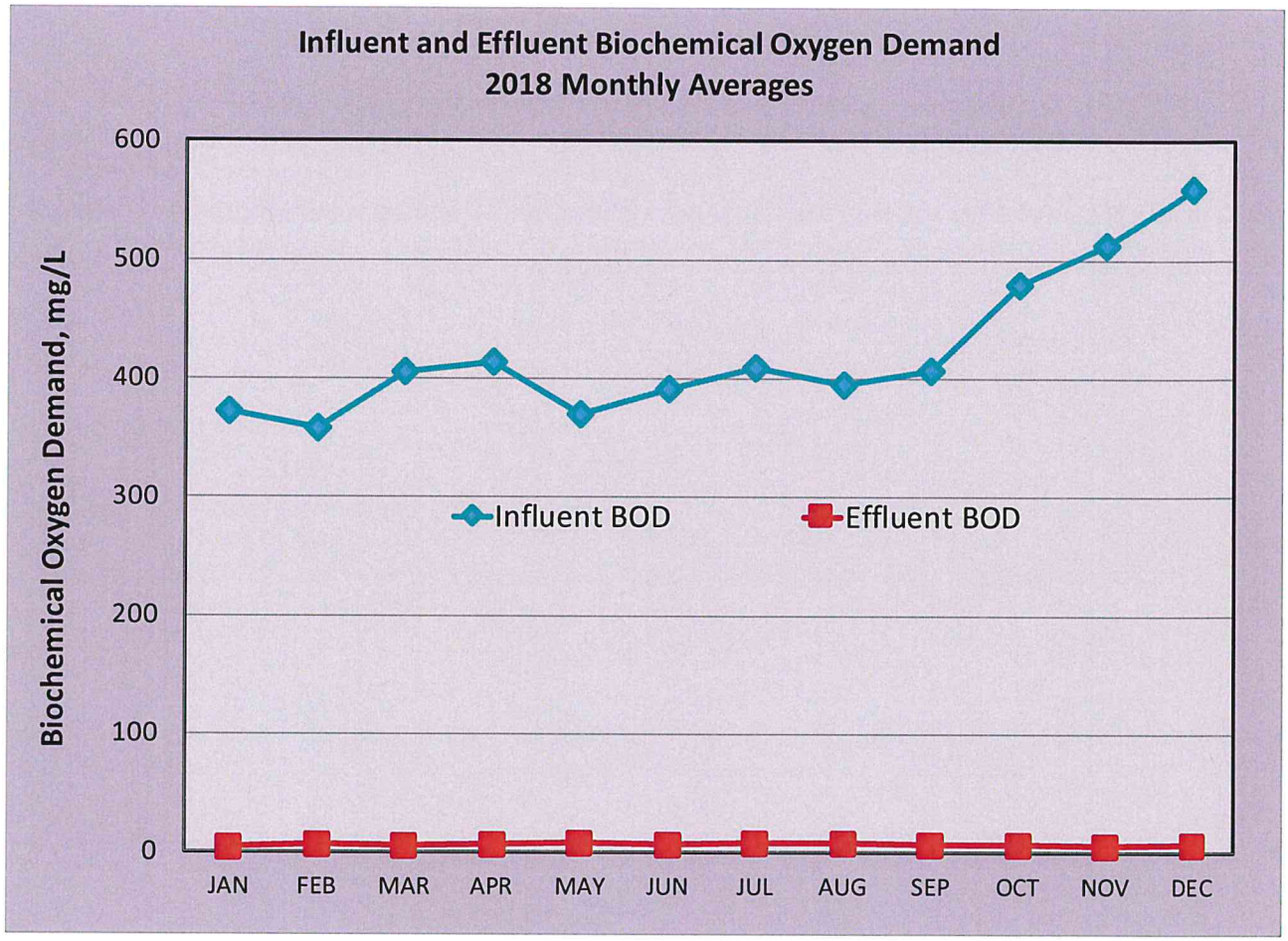
Biochemical oxygen demand (BOD) levels were measured on 24 hour composite samples of the influent and effluent, at least monthly and five days per week, respectively.

During 2018 influent BOD averaged 423 mg/L showing an increase of 17% from the annual influent average of 352 for 2017. The influent BOD varied throughout the year, ranging from a monthly average low of 358 mg/L in February to a high of 560 mg/L in December.

A small variation in the monthly average final effluent BOD concentration was observed throughout the year with the annual average of 6.8 mg/L and the range extending from a low of 4.7 in January to a high of 8.4 in July, (Table 2-1). The difference between influent and effluent BOD represents an overall removal rate of 98.3 percent.

The NPDES R3-2017-0021 permit limits are an average of 30 mg/L and weekly average of 45 mg/L. All BOD NPDES limitations were achieved throughout the year.

Figure 2-5. Influent and Effluent Biochemical Oxygen Demand 2018 Monthly Averages



In 2018, all effluent BOD mass emission values were below all limitations. The maximum monthly average mass emission was 244 lbs/day for February. The mass emission limit is based on average dry weather flow (ADWF) and is a limit that only applies to dry weather flows (DWF). There is no limit for mass emissions on wet weather flows. The mass emissions limits specified in permit R3-2017-0021 are a monthly average of 1,912 lbs/day and the average weekly limitation of 2,867 lbs/day. None of the permit limits were exceeded during 2018.

Table 2-2. Monthly Averages of Effluent Parameters, Goleta Sanitary District, 2018

	pH		Turbidity	Settleable Solids	Oil and Grease		Toxicity Chronic
	Influent	Effluent	Effluent	Effluent	Effluent	Mass Emission	Effluent
Month	SU	SU	NTU	mL/L/hr	mg/L	lbs/day	TUc
January	7.8	6.6	2.0	0.10	2.4	≤ 85.4	3.1
February	7.9	6.8	1.7	0.10	2.3	< 78.7	
March	7.9	6.9	1.5	0.14	< 3.7	< 136.3	
April	8.0	6.9	1.8	0.16	< 3.7	< 123.8	3.1
May	7.9	6.7	2.0	0.15	< 3.7	< 119.4	
June	7.7	6.4	1.6	0.14	< 3.7	< 89.0	
July	7.5	6.6	1.5	0.12	< 3.7	< 87.8	3.1
August	7.7	6.6	1.4	0.13	< 3.7	< 90.1	
September	7.7	6.6	2.1	0.15	< 3.7	< 107.7	
October	7.6	6.6	2.0	0.17	< 3.7	< 119.8	3.1
November	7.6	6.7	1.8	0.15	< 3.7	< 116.6	
December	7.7	6.8	1.5	0.17	< 3.7	< 134.1	
Average	7.8	6.7	1.7	0.14	< 3.7	< 107.4	3.1
Limit	NL	6 to 9	75	1.0	25	1590	123

NR = Not-Required NL = No Limit

Hydrogen-Ion Concentration (pH)

Influent pH was monitored weekly and effluent pH levels were monitored five days per week to ensure that the effluent remained within an acceptable range when discharged into the ocean. Influent pH averaged 7.8 units for the year; effluent pH averaged 6.7 units. The NPDES effluent pH limitations are established as a minimum of 6.0 and a maximum of 9.0 pH units, all pH values were well within these limitations for 2018.

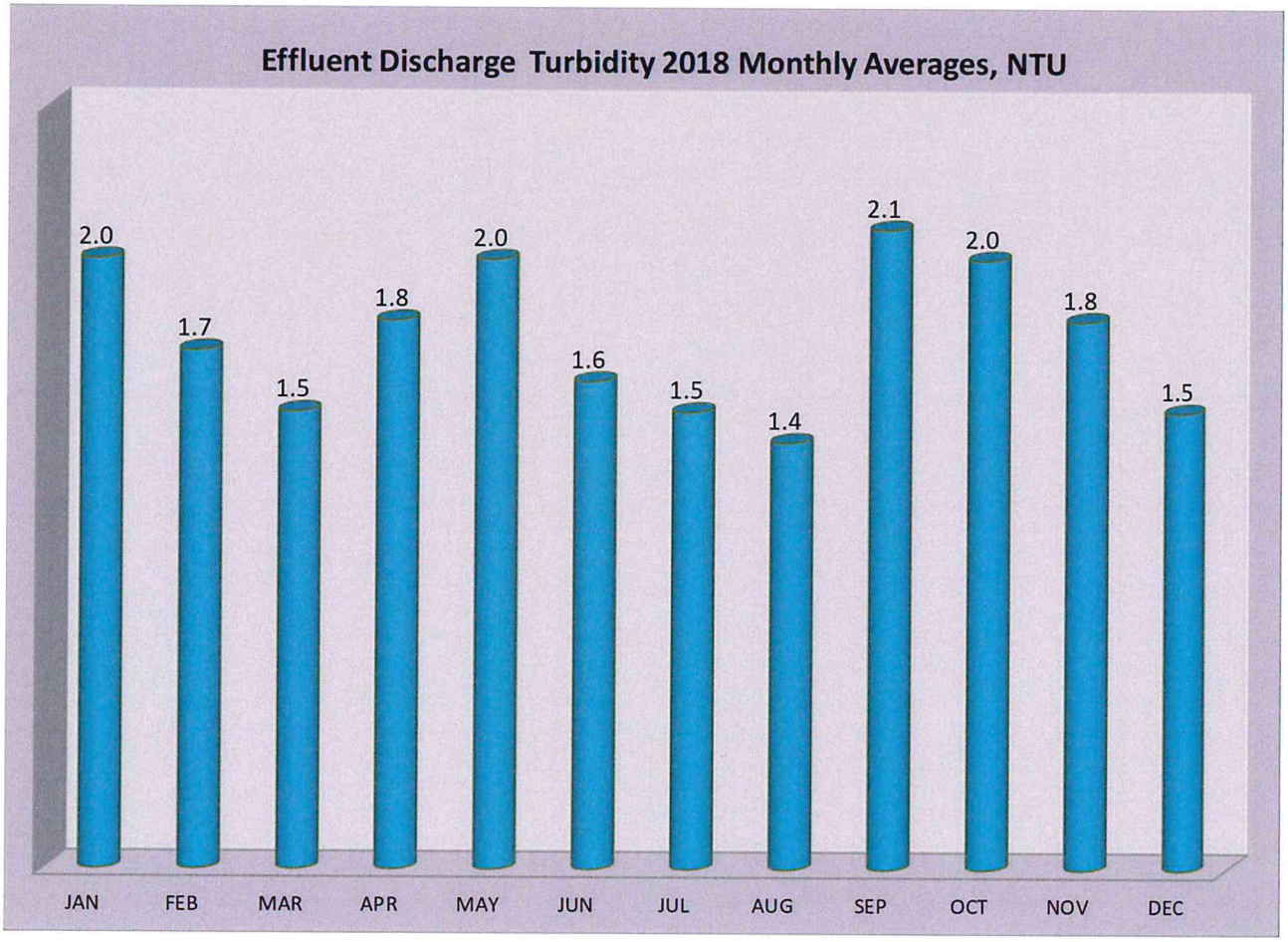
Ammonia

The effluent was monitored monthly during April and October, to determine the concentration of ammonia. The current permit, R3-2017-0021, does not include ammonia effluent limits or monthly testing requirements because no reasonable potential was determined for the pollutant during the permit renewal reasonable potential analysis. The effluent measured ammonia concentration was below the lowest calibration standard at 1.0 mg/L and the method detection limit (MDL) of 0.42 mg/L on both occasions.

Turbidity

Effluent turbidity was monitored five days per week. The permit limitations for effluent turbidity consists of a monthly average of 75 Nephelometric Turbidity Units (NTU), a weekly average of 100 NTU, and a maximum at any time limitation of 225 NTU. Effluent turbidity data are shown graphically in Figure 2-6. The maximum value at any time, 3.4 NTU, occurred on September 16 which was still well below the effluent limits. Monthly averages ranged from a low of 1.4 NTU to a high of 2.1 NTU. All values were significantly below their respective permit limitations.

Figure 2-6. Effluent Discharge Turbidity 2018 Monthly Averages, NTU



Chronic Toxicity Concentration

The effluent was analyzed for chronic toxicity (TU_C) on a quarterly basis in January, April, July, and October. The special testing conducted during 2011 to identify the most sensitive chronic toxicity organism showed that the abalone development test was the most sensitive. All results were well below the daily maximum limitation of 123 TU_C. See Table 2-2.

Settleable Solids

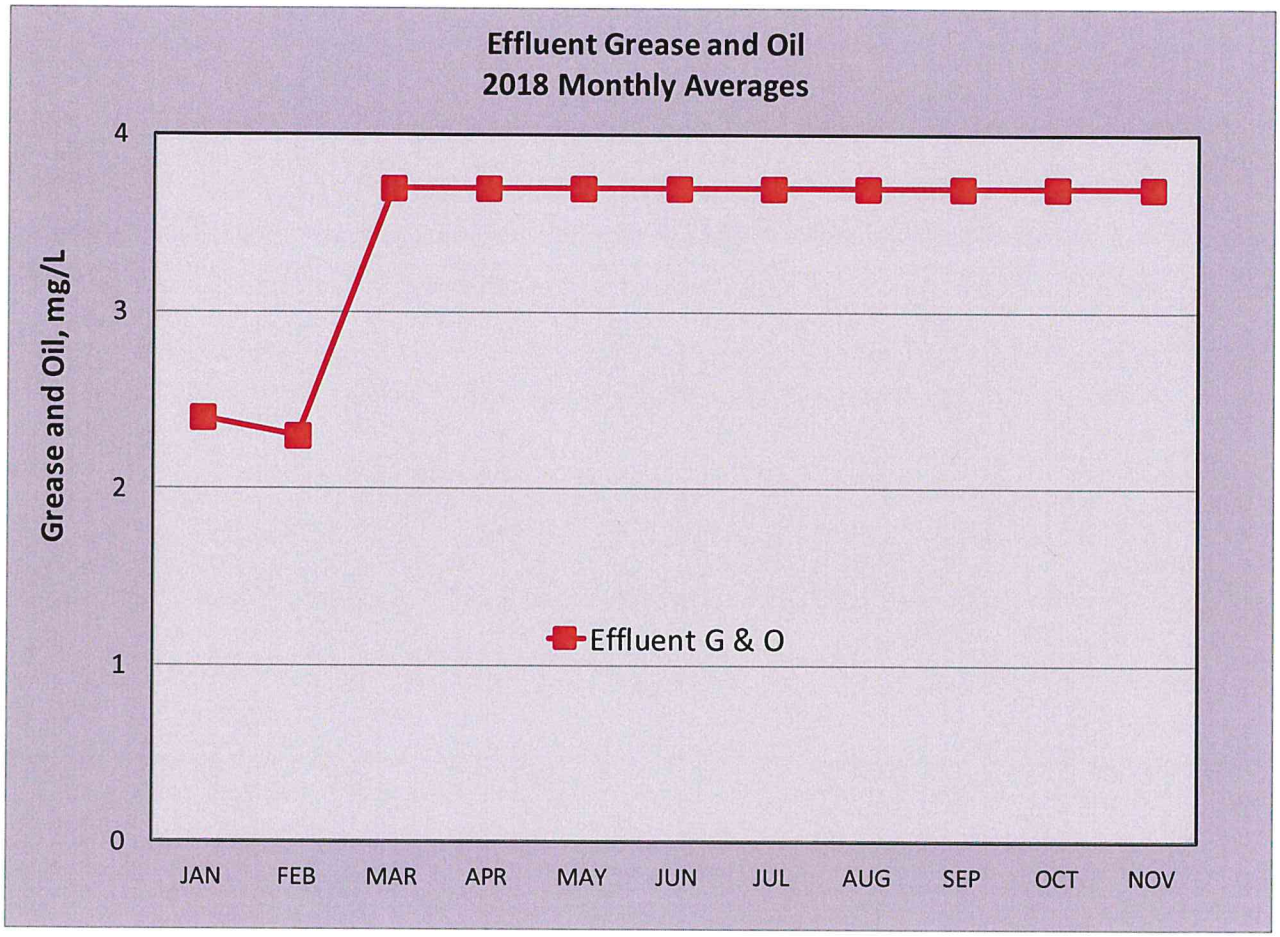
The effluent was monitored for settleable solids concentrations 5 days per week. The permit specifies that the monthly average, weekly average, and maximum at any time may not exceed 1.0 milliliters/liter/hour (ml/L/hr), 1.5 ml/L/hr, and 3.0 ml/L/hr, respectively. Monthly averages ranged from 0.10 ml/L/hr to 0.17 mL/L/hr. The maximum value at any time was 0.40 mL/L/hr which occurred on the 21st of March. All values were well below their respective permit limitations.

Oil and Grease

Effluent oil and grease were monitored weekly. Monthly average results are shown graphically in Figure 2-7. Prior to August 2007 Freon was the solvent used in the standard method to extract oil and greases from water samples. According to EPA regulations, in August 2007 the GSD laboratory ceased using Freon as the extraction solvent and began using hexane as the required solvent. The District continued to use the liquid-liquid extraction method, the only change at this time was the solvent. In December 2010, the GSD laboratory began analyzing for oil and grease using the approved standard solid phase extraction (SPE) method. The current permit, R3-2017-0021, eliminated the influent oil and grease monitoring requirement.

Effluent grease and oil concentrations were very low and consistent during 2018. All monthly, weekly, and maximum permit limits were met. Mass emissions values ranged from a monthly average low of 78.7 lbs/day in February to a high of 136 lbs/day in March. Both are well below the permit limitation of 1,590 lbs/day. Monthly average oil and grease concentrations in the effluent ranged from 2.4 mg/L to <3.7 mg/L which is below the method detection limit. The method detection limit changed to 3.7 in February 2018 because a new value was calculated. See Table 2-2 for a visual representation of the monthly average results. All permit limitations for effluent oil and grease were met during 2018.

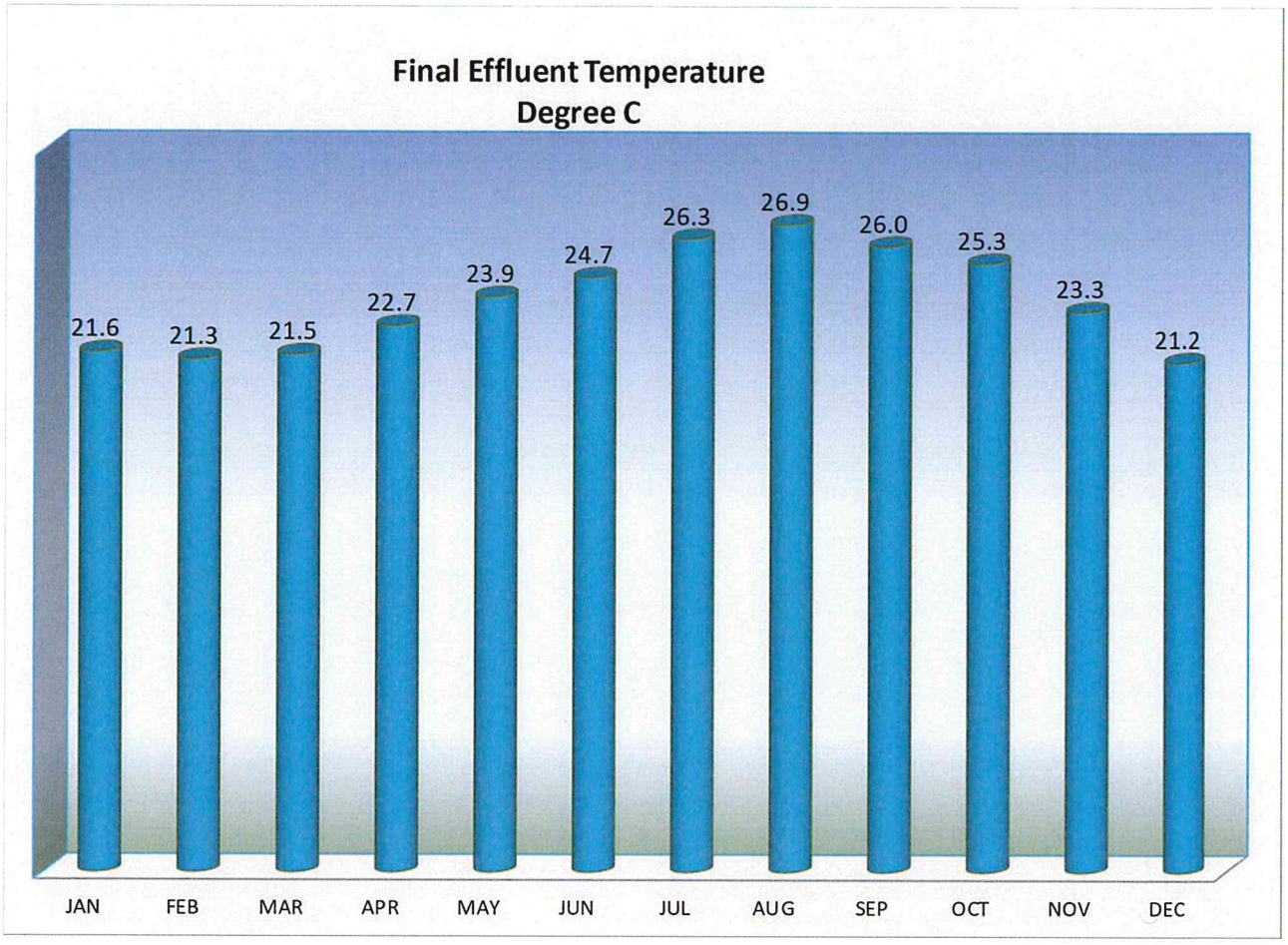
Figure 2-7. Effluent Grease and Oil 2018 Monthly Averages



Temperature

Effluent temperature was sampled five days per week throughout 2018. The data reflect a typical response to seasonal changes (Figure 2-8). The coolest temperatures occurred during December with average monthly temperatures of 21.2 ° C. A warming trend continued throughout the summer and fall months to reach a monthly averaged high of 26.3 ° C, 26.9 ° C, and 26.0 ° C in July, August and September respectively. As expected, the year ended with a cooling trend during November and December.

Figure 2-8. Effluent Discharge Temperature 2018 Monthly Averages



Wastewater Disinfection

Sodium hypochlorite is used to disinfect the treated wastewater at the Goleta Sanitary District. The sodium hypochlorite is flash mixed into the wastewater at the beginning of the chlorine contact channel. At an average effluent flow rate of 4 MGD, the chlorine is in contact with the wastewater for approximately 2½ hours (145 minutes).

The Goleta Sanitary District maintains its chlorine contact tank to provide maximum chlorination effectiveness at all times. The chlorine residual at the end of the chlorine contact channel averaged 7.4 mg/L during 2018. The average monthly values are reported in Table 2-3.

After the disinfection process is complete, the sodium hypochlorite is neutralized (dechlorinated) by adding sodium bisulfite to the wastewater stream. This process lowers residual chlorine to levels that are environmentally safe, before discharge to the ocean such that the chlorine poses no risk to the receiving water environment. Treatment plant

personnel continuously monitor the residual chlorine levels as required by the NPDES permit.

The permit limitations for residual chlorine in the effluent immediately prior to discharge and after dechlorination are as follows: 6-month median of 0.25 mg/L, daily maximum of 0.98 mg/L, and instantaneous maximum of 7.4 mg/L. After dechlorination, the monthly average residual chlorine levels were very consistent throughout the year; near or below the detection limit of 0.05 mg/L for all months. The monthly average values are shown in Table 2-3.

Effluent Bacteria

The effluent was analyzed five days a week for total coliforms, fecal coliforms and enterococcus bacteria. The permit specifies that effluent limits will apply if the Executive Officer concludes that the discharge consistently exceeds receiving water limitations. The monthly average values for total coliform, fecal coliform, and enterococcus bacteria detected in the effluent are presented in Table 2 3. Monthly average values ranged from 19.0 to 183 MPN/100 mL for total coliform, from 2.0 to 11.3 MPN/100 mL for fecal coliform, and 1.0 to 3.7 MPN/100 mL for enterococcus. The monthly mean values presented below illustrate that the results were consistently low throughout the entire year, thereby demonstrating the effectiveness of the chlorination process.

Table 2-3. Chlorine and Bacteria Monthly Averages, 2018

Month	Chlorine at the end of the CCC	Chlorine after Dechlorination	Total Coliform	Fecal Coliform	Enterococcus
	mg/L	mg/L	MPN/100mL		
January	9.5	< 0.05	55	3.2	1.1
February	8.1	< 0.05	19	3.1	1.3
March	7.6	< 0.05	47	5.8	1.0
April	7.0	< 0.05	23	2.0	1.5
May	7.1	< 0.05	43	3.5	1.0
June	7.0	< 0.05	75	6.9	1.4
July	7.1	< 0.05	74	6.3	1.2
August	7.1	< 0.05	48	6.2	1.0
September	7.1	< 0.05	97	7.5	1.4
October	7.1	< 0.05	183	11.3	2.2
November	7.0	< 0.05	65	8.5	1.7
December	7.1	< 0.05	51	3.4	3.7

Priority Pollutants and Metals

The NPDES permit requires priority pollutant and metals analyses to be performed on influent and effluent composite samples annually. Compounds detected in the influent and/or effluent samples are presented in Table 2-4; complete copies of all the laboratory reports listing all the chemical compounds and analytical methods are available for review at the Goleta Sanitary District laboratory. Eighteen compounds were detected in the influent and eleven in the effluent. Concentrations of detected chemicals are all reported as parts per billion except for TCDD and radioactivity which the units are noted next to the parameter in the table.

Table 2-4. Detected Priority Pollutants and Metals, Goleta Sanitary District, 2018

Parameter, units	Influent, ug/L	Effluent, ug/L
Acetone	176	ND
Ammonia	43.1	ND
Antimony	1.7	ND
Arsenic	1.5	1.2
Cadmium	0.2	ND
Chloroform	3.2	69.4
Chromium	5.3	3.9
Chromium III	5.3	ND
Copper	110	5.1
Dibromochloromethane	ND	7.6
Dibromomethane	ND	1.8
Dichlorobromomethane	ND	24
Lead	1.6	ND
Nickel	8.2	6.3
Mercury	0.74	ND
Methyl Ethyl Keytone	4.1	ND
Methylene Chloride	ND	6.9
Phenols, Non-chlorinated	25.9	ND
TCDD, equivalents, pg/L	0.422	0
Selenium	2.5	3.1
Zinc	150	21
Radioactivity, total Alpha (226) pCi/L	0.096 ± 0.113	0.00 ± 0.075
Radioactivity, Ra (228) pCi/L	0.00 ± 0.631	0.00 ± 0.666
ND = Not Detected		

DISCHARGE COMPLIANCE

Throughout 2018 the wastewater discharge from Goleta Sanitary District complied with all applicable permit effluent limitations. All other monitored parameters were below their respective limitations as required by the permit. All metals, priority pollutants, and pesticides were low or undetected throughout the year.

OCEAN OUTFALL CONDITIONS

The outfall pipeline, diffuser section, and armor rock protection were inspected by divers from Aquatic Bioassay and Consulting Laboratories, Inc. in October 2018. A report was prepared documenting the inspection findings of the diffuser section and along the outfall pipeline and armor rock.

During the diffuser dive survey, 36 diffuser ports were carefully inspected for flow and general efficiency. The remainder of the outfall pipe was inspected for damage, leaks or evidence of leaks and general stability of the pipe and armor rock. Inspection of the outfall yielded no evidence of damage, holes, cracks, or erosion. The pipe and associated armor rock appeared stable with little or no displacement.

The complete report of the outfall dive survey is included as Chapter 3 of this report. Copies of the outfall dive on DVDs are available at the District for review.

3.0 Introduction

Aquatic Bioassay biologists conducted underwater dive surveys and underwater videos of the outfall pipe and diffuser from the Goleta Sanitary District Wastewater Treatment Plant on October 26th, 2018. The purposes of the survey were to inspect the physical integrity of the outfall pipe and associated armor rock and note any impediments to flow from the 36 diffuser ports. Aquatic Bioassay biologists also assessed the presence of attached and mobile marine organisms that were associated with the outfall and the diffuser.

3.1 Materials and Methods

Four divers, using GoPRo 5 Hero enclosed in underwater housings, conducted the survey. Once the outfall had been located by global positioning (GPS) and bottom finder, a buoy, attached to a line and a weight, was deployed over the side. Divers entered the water, descended down the line, swam to the diffuser terminus, and began filming. At the end of each dive, a lift float was deployed as a marker for the subsequent dive. On deck between dives, the camera was removed from the housing, the footage was inspected, batteries were replaced, and the housing was reassembled. A total of four dives were completed for the video: diffuser, west and east ports (100 ft. to 70 ft.); deep outfall (70 ft. to 40 ft.); middle outfall (40 ft. to 25 ft.), and shallow outfall (25 ft. to surf zone).

The footage was downloaded to computer files, edited using *Adobe Premiere* software. The footage was then reviewed by the survey team to assess conditions of the outfall. The video is arranged from the deepest part of the dives (outfall terminus) to the shallowest part of the dives (outfall beginning).

3.2 Results

Outfall dive surveys were conducted between approximately 0800 and 1100 hours on October 26th, 2018 aboard the *Extreme*. Weather conditions were fair with a 5 knot wind and 2 ft. swell from the southwest (245 °). There was a thermocline at approximately 12 meters. Water color was green with moderate turbidity. Visibility at the terminus of the diffuser (100 feet) and throughout the dive was 0 to 3 meter.

3.2.1 Diffuser Section (Depth: 100 TO 70 ft)

3.2.1.1 Physical Description

The pipe survey was conducted in the October in hopes that water quality would be optimal for taking video footage of the pipe. This year's visibility was moderate to poor, ranging from 3 to 0 meters. The diffuser section contains 34 lateral and two terminal discharge ports. The lateral ports are alternately arranged 17 on each side of the diffuser. The end of the pipe is closed except for the two terminal ports, which are situated one above the other. There were no obstructions on the upper port of the terminus cap, however there was little or no flow from both the upper and lower terminal ports.

The terminus and then the lateral ports were observed and videotaped, starting on the east side of the pipe, and moving shoreward until the most shoreward east port was occupied at the beginning of the diffuser. The west ports were filmed starting with the most shoreward west port and moving offshore to the terminus. Minor shell debris was removed from several ports, however all the lateral ports were flowing freely. Along the length of the diffuser pipe, no evidence of leaks, damage, erosion, holes, or cracks were observed.

An approximately one meter high bed of armor rock supports the diffuser section. Intermittent observations of the supporting armor rock revealed a stable bed of rock with little displacement throughout the diffuser section. Probably during initial construction, the diffuser section appears to have been rotated counter-clockwise (as if one were facing the terminus). Thus, the line across east and west diffuser ports is not parallel to the sea floor, and west ports are about 30 cm lower than east ports. Armor rock covers the outfall from the shoreward beginning of the diffuser to the shoreward beginning of the outfall in very shallow water. The thickness of the armor rock is about one meter.

3.2.1.2 Biological Description

Because of the depth and relative low light at the diffuser (100 ft), algal species are typically scarce. Algae that were present included the kelp *Desmarestia ligulata* a tubular and leafy red alga (Rhodophyta), crustose coralline algae (Corallinaceae) and the Turkish Towel (*Gigartina sp.*). Among invertebrates; brown cup coral (*Paracyathus sternsi*), colonial strawberry anemones (*Corynactis californica*), red gorgonian (*Lophogorgia chilensis*), bat star (*Patiria miniate*) and various species of colonial hydroids and bryozoans dominated. Tube worms and especially the strawberry anemones were commonly observed surrounding the diffuser ports. Sheepshead (*Semicossyphus* pulcher), barred sandbass (*Paralabrax* nebulifer), treefish (*Sebastes* serriceps) greenling (*Hexagrammos decagrammus*) and kelp bass (*Paralabrax clathratus)* were observed either on the pipe, or in its immediate vicinity.

3.2.2 Deep Outfall Section (Depth: 70 TO 40 ft)

3.2.2.1 Physical Description

Throughout the dive survey, the outfall was completely covered by approximately one-meter layer of armor rock. The rock covered pipe extended vertically from the sea floor for about 2 to 3 meters and laterally for about 6 to 7 meters. The armor rock bed appeared stable with little displacement throughout this section. No obvious leaks or discoloration were observed from the armor rock covering the top or sides of the outfall pipe.

3.2.2.2 Biological Description

On this section, crustose coralline alga (Corallinaceae), foliose red algae (*Gigartina sp.*) and several species of brown algae (Phaeophyta) dominated the algal community. Among invertebrates, the most abundant were the colonial strawberry anemones (*Corynactis californica*), red gorgonian (*Lophogorgia chilensis*), several species of bryozoans, tunicates, purple urchin (*Strongylocentrotus purpuratus*), red urchin

(*Strongylocentrotus franciscanus*), giant sea start (*Pisaster gigantis*) California Spiny Lobster (*Panulirus interruptus*) and the giant keyhole limpets (*Megathura crenulata*). Several fish species were observed including sheepshead (*Semicossyphus pulcher*), barred sandbass (*Paralabrax nebulifer*), kelpbass (*Paralabrax clathratus*), garibaldi (*Hypsypops rubicundus*) opaleye (*Girella nigricans*), and blacksmith (*Chromis punctipinnis*).

3.2.3 Middle and Shallow Outfall Section (Depth: 40 TO Surf Zone)

3.2.3.1 Physical Description

As with the previous section, this outfall section was covered by about one meter of armor rock. The armor rock covered pipe extended horizontally and laterally as above. The armor rock bed appeared stable with little displacement throughout this section. No obvious leaks or discoloration were observed from the armor rock covering the top or sides of the outfall pipe.

3.2.3.2 Biological Description

Dominant algae in this pipe section included foliose red algae (*Gigartina sp.*) and crustose coralline algae and several species of brown algae. Among the macroinvertebrates, purple urchin (*Strongylocentrotus purpuratus*), bat star (*Patiria miniate*) and red gorgonian (*Lophogorgia chilensis*) were most dominant. Fish species observed at this depth included sheepshead (*Semicossyphus* pulcher), rock wrasse (*Halichoeres* semicinctus), kelp bass (*Paralabrax clathratus),* black perch (*Embiotoca jacksoni)*, and halfmoon (*Medialuna californiensis*).

Discussion

During the diffuser dive survey, 36 diffuser ports were carefully inspected for flow and general efficiency. This year, none of the diffuser ports were obstructed with debris and all of the ports were flowing freely. The remainder of the outfall pipe was inspected for damage, leaks or evidence of leaks and general stability of the pipe and armor rock. Inspection of the outfall yielded no evidence of damage, holes, cracks, or erosion. The pipe and associated armor rock appeared stable with little or no displacement.

The outfall continues to support a rocky reef community typical of other areas on the central California coast. A visual survey yielded numerous different species of kelp, macroinvertebrates, and fishes. A number of species of fish were represented by juvenile or larval forms, which indicates that recruitment has been occurring. Fish appeared healthy, with no evidence of deformities, tumors, fin rot, or lesions.

CHAPTER 4

COLLECTION SYSTEM ANNUAL SUMMARY

Background

Sanitary sewer overflows associated with the Goleta Sanitary District's collection system are subject to the online reporting and notification requirements set forth in the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order NO. 2006-0003-DWQ. The Goleta Sanitary District has enrolled under the statewide waste discharge requirement for sanitary sewer systems.

GSD completed the Sanitary Sewer Management Plan (SSMP) in December 2006 and reviews and revises the SSMP annually, as needed. The District's SSMP was updated in September of 2013 in accordance with SWRCB Order No. WQ 2013-0058 – EXEC MRP.

This annual report summarizes all lift station and collection system overflows that occurred during 2018 and includes, if any, the cause, corrective actions taken and corrective actions planned. In conjunction with the annual report the District will conduct the annual SSMP update. The update is a part of the wastewater collection system management plan and requires the District to conduct an internal audit to evaluate the wastewater collection system management plan and delineate steps the District will take to correct any deficiencies that are found.

Annual Reporting Requirement

This chapter is included as part of the wastewater treatment plant annual report.

Summary of 2018 Spills

Lift Station Overflows

There were no lift station overflows that occurred within the Goleta Sanitary District service area during 2018.

Collection System Overflows

There were no collection system overflows that occurred within the Goleta Sanitary District service area during 2018.

Discussion

The Goleta Sanitary District's wastewater collection system management plan has been completed and complies with all of the requirements of MRP No. R3-2017-0021. All detailed tasks have been addressed in a timely manner and the collection system has complied with all requirements of the monitoring and reporting program.